Wind Erosion and Its Control

Wind erosion can be controlled effectively with one or more of the conservation practices described in this brochure.

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Vegetative Cover

Vegetative cover on the land is the most effective way to control wind erosion. Living or dead plant materials on the soil surface reduce wind speed and prevent direct wind contact with the soil.

Residues left on the soil surface after crops have been harvested provide excellent soil protection.

Cover crops are needed when there is little or no residue left after harvest to protect the soil from wind erosion. Cover crops may be planted into a prepared seedbed, or seeded into growing crops if harvest will occur too late for normal seedbed preparation and planting. Cover crops and their residue must be left on the surface to provide protection from wind erosion.

Conservation Tillage

Conservation tillage is any seedbed preparation system that leaves 30% of the soil surface covered with plant residues to prevent erosion before, during and after planting.

Tillage systems that leave crop residues on the surface extend the benefits of crop residues through the planting season. The amount and orientation of residue left on the surface determines the degree of protection provided.

No-till is the most effective form of conservation tillage. All residue from the previous crop stays on the surface for erosion protection.

Wind Barriers

Wind barriers reduce wind erosion in two ways. They lower wind speed enough to prevent soil movement in the sheltered area and they reduce field distance. Wind barriers also reduce crop damage caused by wind. The effectiveness of wind barriers depends on their spacing, height and porosity.

Wind barriers are rows of trees, shrubs or grasses planted perpendicular or nearly perpendicular to the prevailing wind to reduce wind erosion.

Wind velocities on the leeward side of wind barriers are reduced 70 to 80% adjacent to the windbreak and 20% at a distance equal to 20 times their height.

Observations in Nebraska and research in Canada indicate that production in fields with wind protection is greater than in fields without protection.

Stripcropping

Stripcropping is subdividing a field into strips that allow alternating strips of erosion-susceptible crops and erosion-resistant crops. Stripcropping requires no special equipment and does not remove any land from production.

Strip widths are determined by wind velocity and direction, machinery width and soil texture, but usually range from 80 to 120 feet wide. Organic or very sandy soils usually require narrower strips for effective wind erosion control.

Crop Rotations

Crop rotations control wind erosion by limiting the frequency of exposure to wind erosion. Effective crop rotations alternate between erosion-susceptible crops like beans and erosion-resistant crops like legumes or small grains.

Wind Erosion

Wind erosion is a serious problem in Michigan. Organic and sandy soils of Michigan are especially susceptible to wind erosion.

As the state's native forests were cleared and the land cultivated to grow crops, wind erosion became a problem. Because of severe wind erosion and associated damages, wind erosion control continues to be a principal objective of many soil conservation districts in the state.

Although progress has been made, wind erosion continues to damage much land each year. According to a recent inventory, wind erosion is responsible for 42% of the erosion damage that occurs in Michigan each year.

Windblown soil particles damage or kill plants, bury crops, fill road and drainage ditches, cause traffic accidents and pollute the air and water. The most serious damage from wind erosion, however, is the separation and gradual removal of silt, clay and organic matter from the soil. The remaining material is usually coarse, droughty and less fertile.

Wind erosion is caused by strong winds blowing across an unprotected soil surface. The soil starts to erode when wind forces overcome gravity and is carried in three types of movement - ***suspension, saltation*** and ***surface creep.***

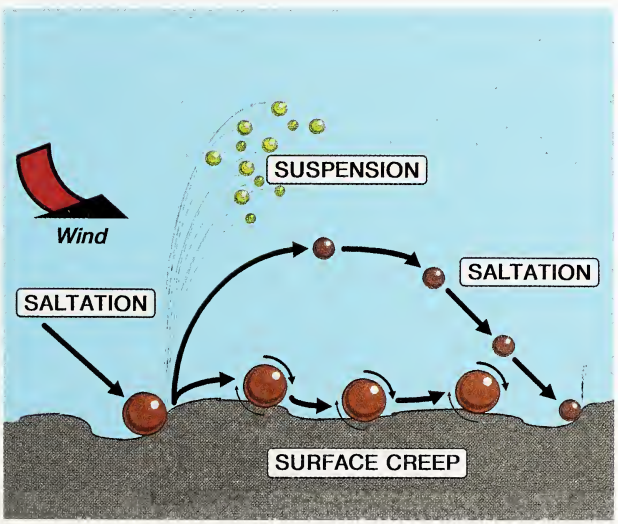
Dust particles are lifted into the airstream by the wind and are carried in ***suspension*** for great distances. Coarser particles move in a bouncing or jumping action called ***saltation***. The rotating soil particles rise or bounce from the surface, then fall forward and downward. When they strike the soil again they dislodge more particles. Larger soil particles roll in the direction of the wind by a process called ***surface creep***.

Once soil movement begins, the jumping soil particles abrade the soil surface and set an increasing number of soil particles in motion. This is called ***soil avalanching*** and continues until the soil flow reaches the maximum the wind can carry.

The amount of wind erosion that occurs is influenced by:

- Windspeed
- Field Distance
- Ground Cover
- Soil Texture

Wind erosion is greatest when the surface is bare, loose, or smooth, wind speeds are high, and there is nothing to block the wind or to shelter the soil.



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